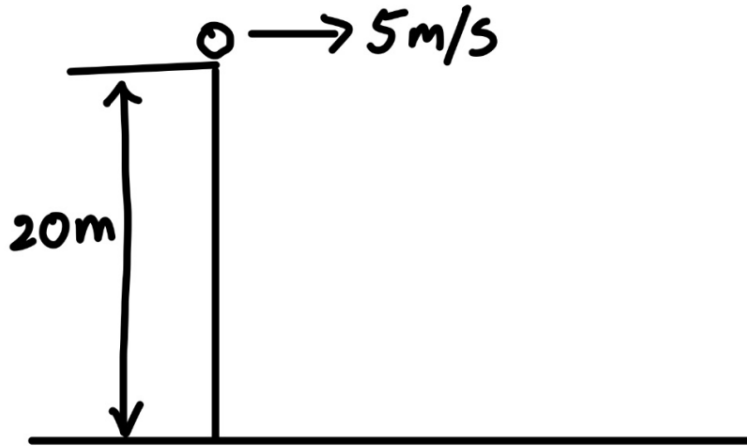


Projectile Motion (Horizontally Launched)

1. A ball is launched from a 20m cliff horizontally with a velocity of 5m/s.



- a) Let's first think in the x direction (horizontal) only. What information do we have in the x direction?
 - b) Now let's think in the y direction (vertical). What information do we have in the y direction?
 - c) How long does it take for the ball to hit the ground?
 - d) How far from the cliff does the ball land (range)?
2. A ball is launched horizontally at 3m/s from a 12m cliff.
- a) Find the range
 - b) Find the velocity of the ball just before it hits the ground (magnitude and direction). To do this, you need to consider both the horizontal and vertical component of the velocity.
3. A ball is launched horizontally from a cliff.
- a) If it took 7s for the ball to hit the ground, how tall is the cliff?
 - b) If the range was 30m, with what velocity was the ball launched at?

4. An arrow is shot horizontally 1.5m from the ground. If the target is 100m away and 1.2m from the ground, with what initial velocity does the arrow need to be shot?

5. An arrow is shot horizontally towards a wall 200m away. If the arrow leaves the bow at 53m/s, how far does the arrow drop from its starting height before hitting the wall?